p1020: graded take-home open-note practice exam (version 203)

Question 1

Let f represent a function. If $f[24] = 13$, then there exists a knowable solution to the equation below.

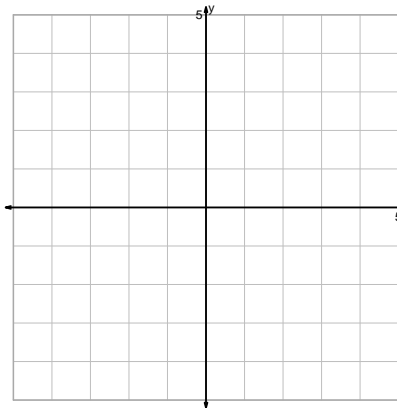$$y = 3 \cdot f\left[\frac{x}{6} + 22\right] + 8$$

Find the solution.

$x =$

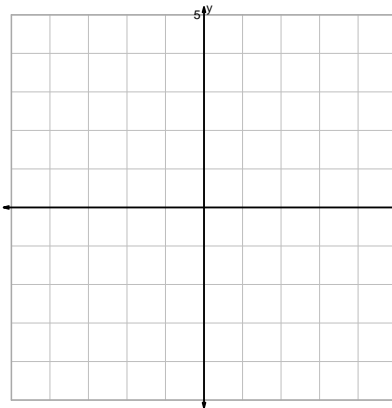$y =$

Question 2

Graph the equations accurately. For each integer-integer point on the parent, indicate the corresponding point precisely. Also, with dashed lines, indicate any asymptotes.
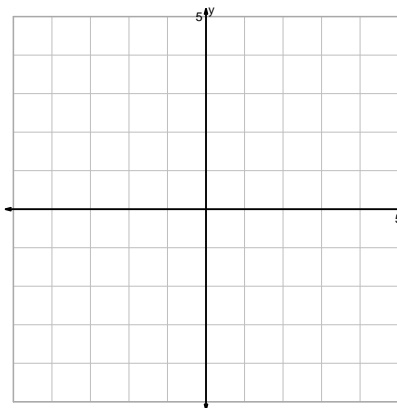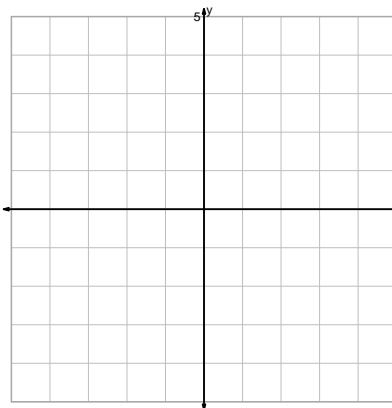
$y = -2^x$

$y = \sqrt[3]{2x}$

$y = 2^{x+2}$
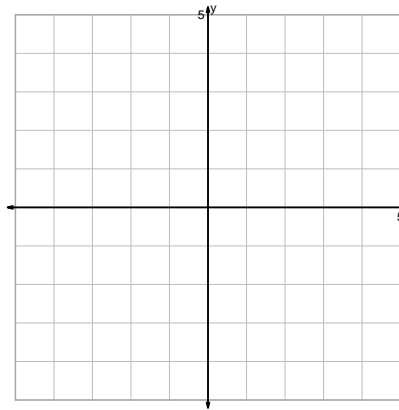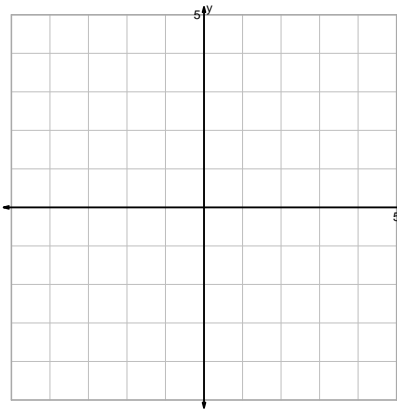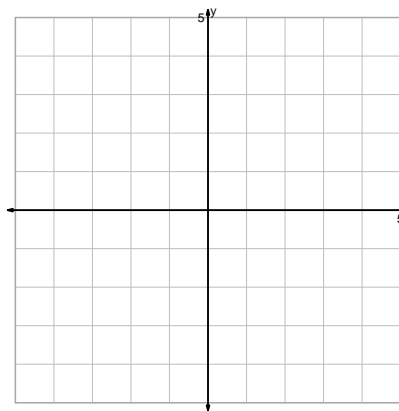

$y = \log_2\left(x\right) - 2$
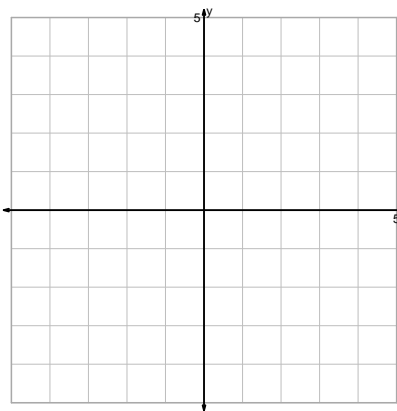
$$y = \frac{x^3}{2}$$
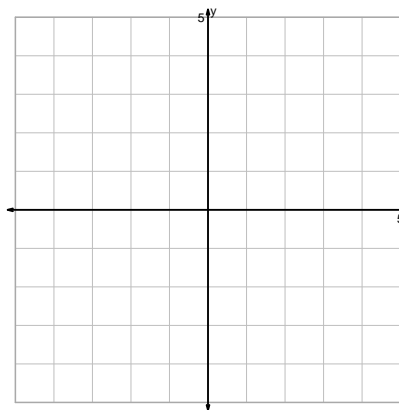
$$y = \sqrt[3]{x} - 2$$
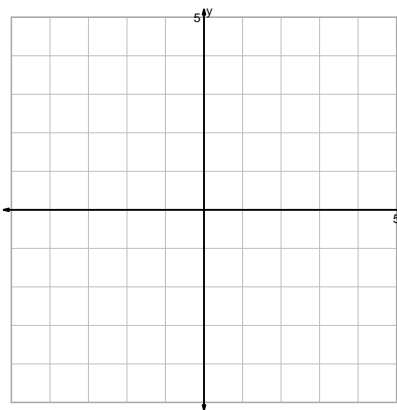
$$y = x^3 + 2$$

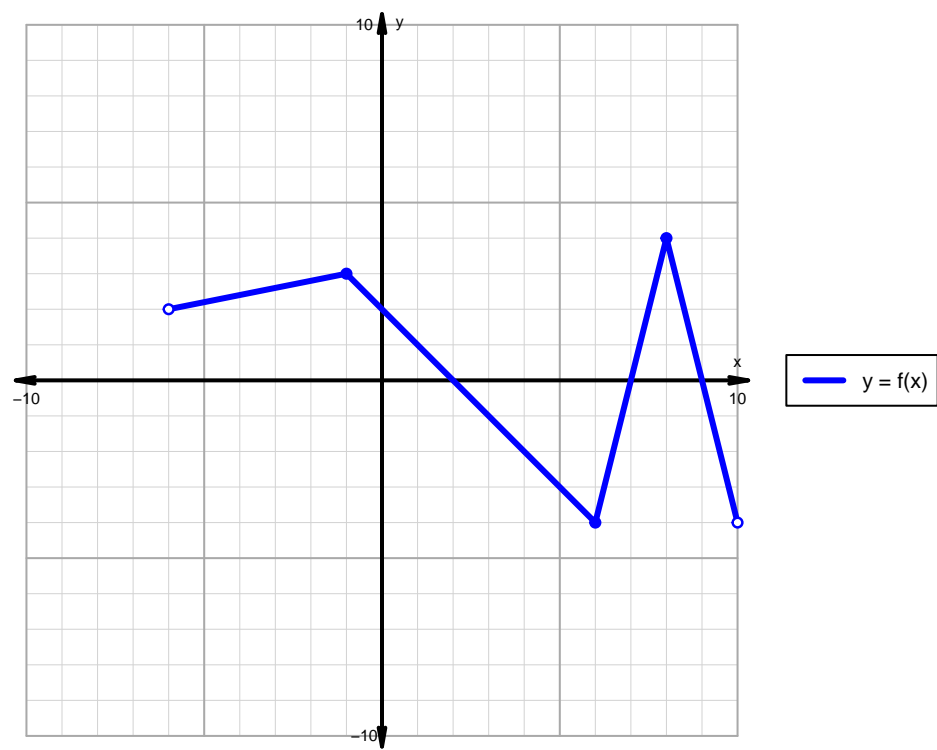$$y = 2 \cdot x^2$$

$$y = \left(\frac{x}{2}\right)^2$$

$$y = \log_2\left(-x\right)$$
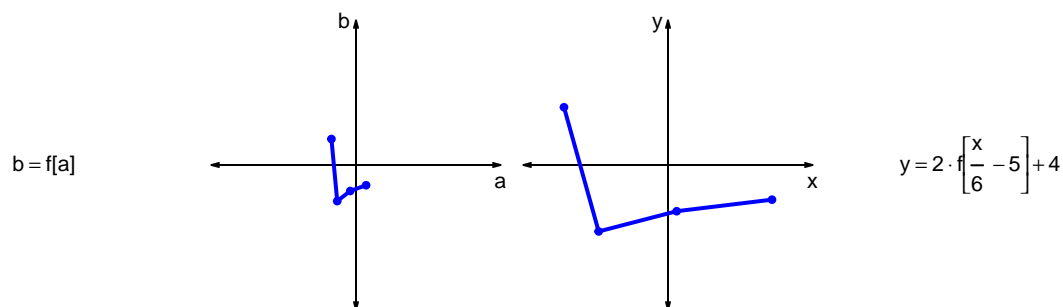
Question 3

A function is graphed below.

Indicate the following intervals using interval notation.

Feature	Where
Positive	
Negative	
Increasing	
Decreasing	
Domain	
Range	

Question 4

Let f represent a function. The curves $b = f[a]$ and $y = 2 \cdot f\left[\frac{x}{6} - 5\right] + 4$ are represented below in a table and on graphs.

a	b	x	y
-17	18	-72	40
-13	-25	-48	-46
-4	-18	6	-32
7	-14	72	-24

$b = f[a]$

$y = 2 \cdot f\left[\dfrac{x}{6} - 5\right] + 4$

a. Write formulas for calculating x from a and calculating y from b. (Or, write the coordinate transformation formula.)

b. What geometric transformations (using words like translation, stretch, and shrink), and in what order, would transform the first curve $y = f[x]$ into the second curve $y = 2 \cdot f\left[\frac{x}{6} - 5\right] + 4$?

4

Question 5

A parent square-root function is transformed in the following ways:
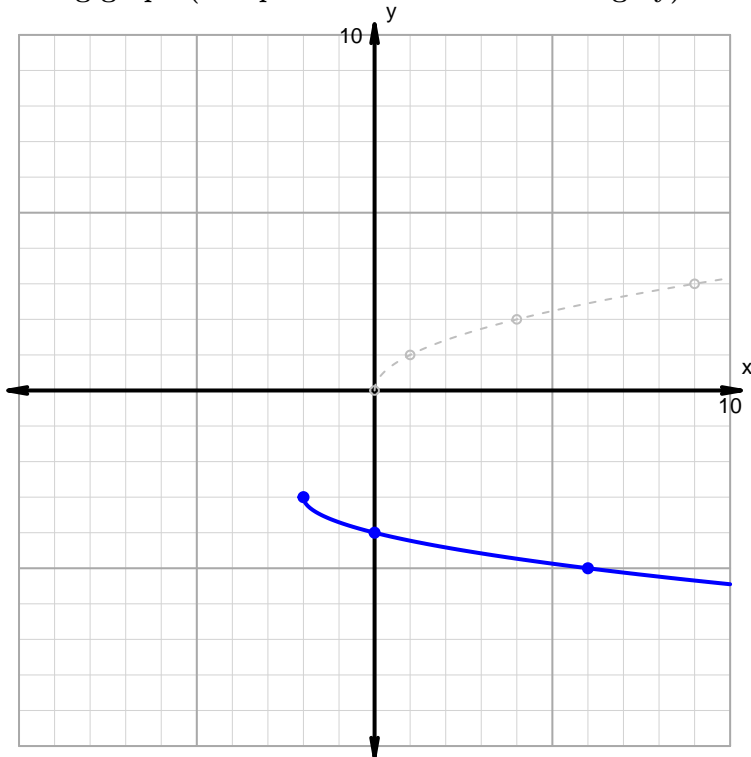
Horizontal transformations

1. Translate left by distance 1.
2. Horizontal stretch by factor 2.

Vertical transformations

1. Translate up by distance 3.
2. Vertical reflection over x axis.

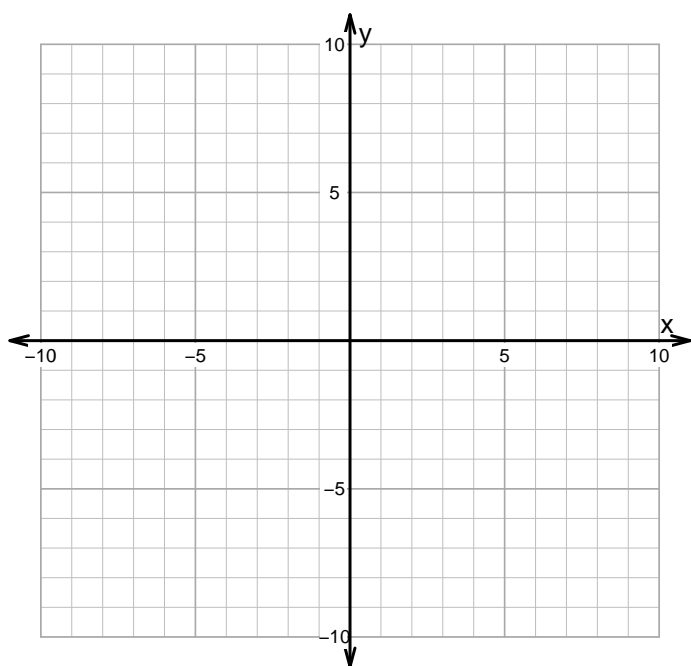**Resulting graph (and parent function in dashed grey):**

- What is the equation for the curve shown above?

Question 6

Make an accurate graph, and describe locations of features.

$$y = 2 \cdot |x - 8| - 2$$

Feature	Where
Domain	
Range	
Positive	
Negative	
Increasing	
Decreasing	